

## PATIENT TRANSPORT BOARD

This application claims the benefit of the filing date of Provisional Application Ser. No. 60/408,983, filed September 5, 2002, entitled PATIENT TRANSPORT BOARD which application is incorporated by reference herein.

### 5 Field of the Invention

This invention relates to the transport of injured persons and more particularly to the transport of such persons through narrow hallways and down stairs such as may be encountered by firefighters and emergency medical personnel.

### 10 Background of the Invention

Emergency Medical Service Personnel (EMS), firefighters and others involved in emergency health situations are often faced with moving an injured or incapacitated person through a confined space or down one or more flights of stairs. Conventionally, such persons are immobilized on a flat backboard for transfer to a suitable area where they can be transferred to a  
15 gurney for transportation to a hospital in an ambulance. To maneuver the board and immobilized patient through a narrow door or through a hall with tight turns requires substantial effort on the part of the personnel carrying the board. Similarly, carrying a board and patient down a flight of stairs can impose a strain on the back of those carrying the board. Except in those situations where a small child is being extricated, it will be seen that a board on which is carried a normal  
20 size person (male or female) represents a substantial amount of weight. Back injuries among firefighters and EMS personnel resulting from carrying and maneuvering patients on backboards down stairs and through confined areas are common resulting in time lost from the job, health

care costs and suffering by the personnel injured.

### Summary of the Invention

The present invention relates to an improved emergency services transport board that can  
5 be used to maneuver an incapacitated person in an upright position through confined spaces such  
as narrow doors and hallways and around tight corners. In one embodiment, the device of this  
invention can be used as a sled for transporting an incapacitated person down a flight of stairs.  
The improved transport board is provided with skids and a skid pad that can be folded into a  
collapsed mode for easy storage on an emergency vehicle.

10 In another aspect of the invention the device may be provided with wheels or full track  
trolleys to transport a patient in a generally upright position down flights of stairs.

### Brief description of the Drawings

FIG. 1 is a perspective view of a transport board in accordance with the present invention;

15 FIG. 2 is a perspective view of an end of the patient transport board partially broken away  
for compactness of illustration showing the spring loaded foot board;

FIG. 3 is an end view of the patient transport board of the invention;

FIGS. 4-5, FIGS. 6a, 6b, 7a, 7b and 8a and 8b illustrate the steps for placing the transport  
board into use for transporting a patient;

20 FIG. 9 illustrates the use of the transport board in the essentially vertical orientation as a  
dolly;

FIG. 10 illustrates one mode of use of the transport board to maneuver a patient down a  
flight of steps;

FIG. 11 is an enlarged scale, partially broken away for compactness of illustration

showing an embodiment of the invention employing the full track trolley;

FIG. 12 illustrates another embodiment of the invention for the conversion of a conventional patient transport board into the patient transport board of the invention;

FIG. 13 shows the transport board in the fully folded mode being received on a gurney;

5 and

FIG. 14 illustrates the full track embodiment of FIG. 11 for maneuvering a patient down a flight of stairs.

### Description of the Invention

Referring to FIGS, 1, 2 and 3, the patient transport board of the present invention, shown generally as 10, comprises a flat rigid board 12 defining an upper surface 14 on which the patient lies, a lower surface 16, a foot end 18 and a head end 20. The board is adapted for restraining the patient by the provision of opposed slots 22 located along the lateral edges of the board through which extend restraining straps 24. At the foot end 18 of the board a spring loaded foot support 26 (FIG.2) is pivotally mounted on the upper surface 14. The foot support 26 pivots between a folded position against the upper surface 14 and, as shown, an extended position essentially vertical to the upper surface to provide a support platform for the patient when the board is non-

10 horizontally positioned. A skid plate 28 is pivotally mounted on the lower surface 16 of the board 12 at the foot end 18 for pivoting into an extended position away from the lower surface of the board. Springs 29 normally urge the skid plate 28 into the extended position and locking clamps (not shown) hold the skid plate in the folded position against the lower surface 16 of the board 12. The skid plate 28 can provide a surface for sliding the lower end 18 of the board 12 when the

15 board is utilized as a dolly. An opposed pair of sled rails 30 are pivotally mounted on the lower face 16 of the board 12 along essentially the length of the board parallel to its longitudinal axis. The sled rails 30 are mounted for folding between a closed position (FIG. 6b) against the lower

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face 16 of the board and an unfolded open position (FIGS.1, 3 and 7a and 7b) essentially normal to the plane of the lower surface. The sled rails 30 are maintained in the open position by a rail support plate 32 that is pivotally mounted on the lower surface 16 at the head end 20 of the board 12 and by the skid plate 28. The skid plate 28 and the rail support plate 32 are notched at their 5 outer corners for receiving an end portion of each sled rail 30 to prevent the sled rails from collapsing back to their closed position. The skid plate 28 also serves as a platform for supporting the patient transport board on a surface on which the skid plate will slide when the board is used in the dolly mode of operation. As an aid in maneuvering the board 12, particularly down a flight of stairs, a flexible cord 31 is attached at one end to each corner of the board and a 10 handle 32 is attached to the opposite end of each of the cords.

In another embodiment of the invention, an axle and wheel assembly 29 is secured at the foot end of each sled rail 30 for ease in maneuvering the board 12 when using it as a dolly rather than using the skid plate 28 to slide the board on the surface. The wheel and axle assembly 29 can be permanently attached to the sled rails 30 for folding with the sled rails for storage. In 15 another embodiment, the wheel and axle assemblies 29 may be removable to allow for placement of the patient transport board 10 on a gurney or in an ambulance and the wheel and axle assemblies separately stored.

Referring to FIG. 11 in yet another embodiment, a pair of track assemblies 50 are affixed at the foot end 18 of the board 12. This embodiment of the invention is particularly useful for 20 walking the patient transport board down a flight of stairs by a single individual with the board 12 in an essentially upright attitude.

Each track assembly 50 comprises a front and rear bogey wheel 52 on which is supported a suitable endless track 54. For example, flexible reinforced plastic material is highly suited for use as the track material and is readily available. The track assembly 50 further comprises an axle

56 for each bogey wheel, a tie rod 58 extending between the axles 56 and an suspension bar 60 connected to the tie rod and to the board 12. In the embodiment of the invention shown in FIG. 11, the suspension bar 60 is pivotally affixed on the board 12 to pivot about an axis that is normal to the longitudinal axis of the board so that the track assemblies 50 freely pivot to a folded position in which the track assemblies lie in a plane parallel to the upper surface 14 of the board 12. As illustrated, the suspension bar 60 is journaled at each edge of the board 12 and extends through a passage (not shown) and the track assemblies pivot simultaneously.. Alternatively, a separate suspension bar 60 for each track assembly 50 is journaled in each edge of the board 12. In this case the track assemblies pivot independently of the other. In cases where it is difficult or inconvenient to journal the suspension rod 60 in the board 12, a single suspension bar 60 can be pivotally affixed to the lower surface 16 of the board so that the track assemblies 50 pivot simultaneously. It is within the scope of the invention, however, that that the suspension rod 60 be non-pivotally affixed to the board 12 and that the track assemblies 50 be pivotally connected to the suspension rod for pivoting about an axis normal to the axis of the suspension rod.

The steps for placing the patient transport board 12 in operation are shown in FIGS. 4, 5 FIGS. 6 a and b through FIGS. 8a and b. The first step is to pivot the foot support 26 from its folded position to its open position to extend substantially normal to the lower surface 16 of the board 10 as shown in FIG. 2. The patient is then placed on the board and secured by the restraining straps 24 (FIG. 4). A neck collar 25 is also placed on the patient to support the patients head. Once the patient is secured, the board 12 is lifted into a vertical position (FIG. 5) and the skid plate 28 is unfolded from its position against the lower surface 16 of the board (FIG. 6a and 6b). The sled rails 30 are pivoted into the open position with the ends thereof restraining the skid plate 28 (FIG. 7a and 7b). The rail support plate 32 is unfolded and the sled rails 30 are

secured in the notched corners of the rail support plate (FIG. 8a and 8b). At this point the patient transport board 10 can be utilized as a dolly with the patient supported thereon in a substantially upright position.

As mentioned the patient transport board 10 of the present invention can be maneuvered in tight places such making turns in narrow hallways and the like. Referring to FIG. 9, the transport board 10 can be placed in a substantially vertical orientation without harming the patient who is secured to the board 12 and is further supported in the vertical orientation by the foot support 26.

One or two attendants may maneuver the board 12. Thus, with two attendants, one attendant supports the top end 20 of the board 12, as the other attendant pulls the lower end 18 using the cords 31 and handles 32 to maneuver the board on the axle and wheel assembly 29, or if there are no wheels, causes the skid plate 28 to slide on the floor allowing the transport board to be maneuvered while in an essentially vertical position. In this position the transport board 10 is readily moved through tight hallways and the like and is easily rotated for making tight turns. It will be clear, however, with the embodiment having wheel assemblies 29 or the track assembly 50, the patient transport board 10 can be readily maneuvered by a single attendant

When the transport board is supported by the sled rails 30, the patient is readily moved down a flight of stairs. As shown in FIG. 9 and 10, the EMS personnel use the cords 31 and handles 32 at each end of the transport board and slide the transport board on the sled rails 30 down the stairs. Use of the sled rails 30 allows for smooth descent or ascent, as the case may be, and jarring of the patient can be kept at a minimum.

Referring to FIG. 14, the embodiment of the invention employing the track assemblies 50 is advantageously employed in a stair descent in a substantially upright mode, much the same as in the dolly mode. The track assemblies 50 support the patient transport board 10 essentially on

the edge of several steps of the staircase and provide the bogey wheels 52 with a smooth endless surface that eliminates much of the jarring that would occur if a descent of the stairs were to be attempted with the transport board in the essentially upright dolly mode of operation without the track assemblies.

5        Once the patient is extricated from the narrow hallway and/or up or down any steps, the transport board can be returned to its folded position by reversing the steps described above. Once folded, as shown in FIG. 13, the transport board can be placed directly on a gurney for transport to an ambulance without the necessity of again moving the patient.

While the invention has thus far been described in connection with embodiments in  
10    which the board 12, sled rails 30, foot plate 26, wheel assemblies 29 or track assemblies 50 and support plate 32 comprise a single assembly, in many cases it may be desirable to utilize conventional transport boards by converting them to a patient transport board 10 in accordance with the invention. This is accomplished by providing a frame member, shown generally as 50 that comprises a pair of spaced apart longitudinal members 52 and an upper transverse member  
15    54 and a lower transverse member 56 that cooperate with the longitudinal members to form the frame member. The spacing between the longitudinal members 52 is substantially the width of a conventional transport board.

In the embodiment shown, the lower transverse member 56 is pivotally mounted on the longitudinal members 52 for movement between a folded position and an extended position (as  
20    illustrated) and thus serves as the foot support described above in connection with the embodiments of the invention illustrated and described in connection with FIG. 1. Likewise, the upper transverse member 54 is pivotally mounted for movement between a folded position (as shown) and an extended position to serve as the rail support plate the function of which is described above. Sled rails 30 are pivotally mounted on the longitudinal members 52 and

function as described above in connection with the embodiments of the invention illustrated in FIGS. 1 – FIG. 10. Straps 24 are affixed around the longitudinal members 52. A conventional transport board 58 can be positioned between the longitudinal members 52 and is supported at its upper and lower ends by the upper transverse member 54 and the lower transverse member 56.

5 Optionally wheel assemblies 29 or the track assemblies 50 are journeled at the lower ends of the sled rails 30 and are foldable with the sled rails or removable for positioning on a gurney or for storage.

Operation of the assembly 50 and transport board combination is the same as the operation of the patient transport board illustrated and described above in connection with in  
10 FIGS. 1-10.

As will be understood by those skilled in the art, various arrangements which lie within the spirit and scope of the invention other than those described in detail in the specification will occur to those persons skilled in the art. It is therefor to be understood that the invention is to be limited only by the claims appended hereto.

15 Having defined the invention, I claim: